

ABSTRACT

A membrane-electrode-assembly (MEA) for an electrochemical cell employing a gas is disclosed. The MEA includes a proton exchange membrane, a first electrode disposed on one side of the membrane, a second electrode disposed on the opposite side of the membrane, and a metallic layer disposed between the membrane and the first electrode, the membrane and the second electrode, or both. The metallic layer has a composition and thickness suitable for reducing the amount of gas crossover at the membrane by equal to or greater than about 20% as compared to the amount of gas crossover at the membrane in the absence of the metallic layer.